

REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested. Claims 1-6 and 9-22 are in this application. Claims 7-8 have been cancelled. Claims 9-22 have been added to alternately and additionally claim the present invention.

The Examiner objected to the drawings as not being suitable for reproduction. Applicant assumes that the Examiner is referring to the margins. As a result, applicant includes a set of informal drawings with proper margins with the present amendment.

The Examiner rejected claims 1 and 6 under 35 U.S.C. §103(a) as being unpatentable over Lowrey et al. (U.S. Patent No. 5,581,104) in view of Delage et al. (U.S. Patent No. 6,031,255). The Examiner also rejected claim 2 under 35 U.S.C. §103(a) as being unpatentable over Lowrey et al. in view of Delage et al. and further in view of Leuschner (U.S. Patent No. 4,724,471).

The Examiner further rejected claims 3-5 under 35 U.S.C. §103(a) as being unpatentable over Lowrey et al. in view of Delage et al. and further in view of Akram (U.S. Patent No. 6,075,288). For the reasons set forth below, applicant respectfully traverses these rejections.

Claim 1 recites, in part,

“a bipolar transistor disposed in and on the semiconductor substrate, the bipolar transistor having a base region, a collection region and a polysilicon emitter.”

In rejecting the claims, the Examiner pointed to the P+ region connected to Vcc shown in FIG. 8 of Lowrey as constituting the polysilicon emitter of claim 1. The P+ region shown in Lowrey, however, can not be read to be the polysilicon emitter of claim 1. As discussed in column 5, lines 14-15, Lowrey teaches the use of an n-type substrate. Lowrey, however, does not teach that the substrate is formed of polysilicon. In addition, substrates are typically formed of single-crystal silicon. As a result, one skilled in the art would not understand that the substrate was polysilicon.

Thus, since the Lowrey reference fails to teach that the P+ region connected to Vcc is polysilicon, claims 1 and 6 are patentable over Lowrey in view of Delage, claim 2 is

patentable over Lowrey in view of Delage and further in view of Leuschner, and claims 3-5 are patentable over Lowrey in view of Delage and further in view of Akram.

The Examiner additionally rejected claims 7-8 under 35 U.S.C. §103(a) as being unpatentable over Lowrey et al. in view of Delage et al. and further in view of applicant's admitted prior art. However, as noted above, claims 7-8 have been cancelled.

New claim 9 recites, in part,

“a base region of a second conductivity type formed in the collector region;
“an emitter formed on the first semiconductor material on the base region, the emitter having a top surface;

“a base extender formed on the first semiconductor material on the base region, the base extender being formed from a second semiconductor material that is different from the first semiconductor material;

“a layer of dielectric material formed on the first semiconductor material on the base region;

“an ohmic emitter contact formed through the dielectric layer, the emitter contact having a top surface and contacting the top surface of the emitter; and

“an ohmic base contact formed through the layer of dielectric material, the base contact having a top surface, contacting the top surface of the base extender, and being electrically connected to the base region, the ohmic base contact being formed from a third semiconductor material different from the second semiconductor material.”

Applicant, however, has been unable to find anything in either the Lowrey or Delage reference that teaches or suggests a base extender as required by claim 9. As a result, claims 9-13 are patentable over Lowrey in view of Delage.

New claim 14 recites, in part,

“a base region formed in the collector region;

“an emitter formed on the semiconductor material on the base region;

“a base extender formed on the semiconductor material on the base region;

“a layer of dielectric material formed on the substrate material on the base region;

“an emitter contact formed through the dielectric layer, the emitter contact having a top surface and contacting the top surface of the emitter;

“a base contact formed through the layer of dielectric material, the base contact having a top surface and contacting the top surface of the base extender; and

“a heat sink contact formed through the layer of dielectric material, the heat sink contact having a top surface and contacting the top surface of the base.”

Applicant, however, has been unable to find anything in either the Lowrey or Delage reference that teaches or suggests a base extender, a base contact, and a heat sink contact as required by claim 14. As a result, claims 14-22 are patentable over Lowrey in view of Delage.

Thus, for the foregoing reasons, it is submitted that all of the claims are in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are respectively requested.

Respectfully submitted,

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APPENDIX

In the Claims

Please cancel claims 7 and 8.

Claims 9-22 have been added.